storing the first image;

picking up a second pattern that is also formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a second image;

aligning the stored first image and the second image with an accuracy of one pixel unit;

performing local gradation conversion of at least one of the stored first image and the second image to locally match a brightness of the first image with a brightness of the second image; and

comparing the first and second images aligned and locally matched in brightness to detect a defect of the patterns.

2. (Amended) A method according to claim 1, wherein the step of performing local gradation conversion of at least one of the stored first image and the second image to locally match the brightness of the first image with the brightness of the second image is performed by means of a linear conversion having a gain and an offset so that the brightness of the first image can be made substantially equal to the brightness of the second image.--

--4. (Amended) A method according to claim 1, wherein a surface of the substrate is covered with an optically transparent film; and

wherein a surface of the optically transparent film is processed to be flat.

5. (Amended) A method according to claim 1, wherein the step of picking up the first pattern and the step of picking up the second pattern are performed optically.

6. (Amended) A method according to claim 1, wherein the step of picking up the first pattern and the step of picking up the second pattern are performed by use of an electron beam.

7. (Amended) A method of inspecting a pattern, comprising the steps of:

picking up a first pattern formed on a substrate to produce a first image;

storing the first image;

picking up a second pattern that is formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a second image;

performing local gradation conversion of at least one of the stored first image and the second image and aligning the stored first image and the second image with an accuracy of one pixel unit, and then comparing the first and second images to detect a defect and to obtain features of the detected defect; and

displaying information of the features of the detected defect on a screen.

8. (Amended) A method of inspecting a pattern, comprising the steps of:

comparing a first image produced by picking up a first pattern formed on a substrate and a second image produced by picking up a second pattern that is formed on the substrate so as to have naturally the same shape as the first pattern after at least one of the first image and the second image has been subjected to local gradation conversion and the first image and the second image have been aligned with an accuracy of one pixel unit, thereby extracting defects to be proposed, and obtaining certainty information of the extracted proposed defects;

detecting a true defect from the extracted proposed defects; and

producing information of the detected true defect.

9. (Amended) A method according to claim 8, wherein the certainty information of the extracted proposed defects is formed of a degree of inconsistency between the first and second images that results from comparing the first and second images, and a reliability of the degree of inconsistency.

10. (Amended) A method according to claim 8, wherein the certainty information of the extracted proposed defects is information produced based on at least one of a brightness, a local contrast, and a local average of each of the first and second images.

11. (Amended) A method according to claim 8, further comprising the steps of:

storing the first image produced by picking up the first pattern;

aligning the stored first image and the second image produced by picking up the second pattern with an accuracy of one pixel unit; and

performing local gradation conversion of at least one of the stored first image and the second image to correct brightness values of the at least one of the stored first image and the second image;

wherein the comparing step includes the step of comparing the aligned first and second images, at least one of which has brightness values which have been corrected by performing local gradation conversion, to detect defects including the proposed defects.

12. (Amended) A method according to claim 11, wherein the step of aligning the stored first image and the second image is performed for each of a plurality of pixels of the stored first image and the second image.

13. (Amended) A method according to claim 8, wherein the substrate is a semiconductor wafer;

wherein the semiconductor wafer has a surface covered with an optically transparent film; and

wherein a surface of the optically transparent film is processed to be flat.

14. (Amended) A method according to claim 11, wherein the step of performing local gradation conversion of at least one of the stored first image and the second image is performed within each of a plurality of local areas of the at least one of the stored first image and the second image.

15. (Amended) An apparatus for inspecting defects of patterns, comprising:

image pick-up means for picking up a first pattern formed on a substrate and a second pattern that is also formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a first image of the first pattern and a second image of the second pattern;

storage means for storing the first image;

alignment means for aligning the stored first image and the second image with an accuracy of one pixel unit;

local gradation conversion means for performing local gradation conversion to correct a brightness of at least one of the stored first image and the second image;

defect detection means for comparing the aligned first and second images, at least one of which has a brightness which has been corrected by the local gradation conversion means, thereby detecting defects of the patterns; and

output means for producing information of the defects of the patterns detected by the defect detection means.--

--17. (Amended) An apparatus according to claim 15, wherein the local gradation conversion means corrects brightness values of the at least one of the first and second images so as to locally match a brightness of the first image with a brightness of the second image by performing a linear conversion having a gain and an offset.

18. (Amended) An apparatus according to claim 15, wherein the image pick-up means optically picks up the first pattern and the second pattern.

19. (Amended) An apparatus according to claim 15, wherein the image pick-up means picks up the first pattern and the second pattern by use of an electron beam.

20. (Amended) An apparatus according to claim 15, wherein the output means displays on a screen information of a brightness, a local contrast, or a local average of the first and second images.

21. (Amended) An apparatus according to claim 15, wherein the local gradation conversion means corrects the brightness of the at least one of the stored first image and the second

image after the alignment means has aligned the stored first image and the second image with the accuracy of one pixel unit.

22. (Amended) An apparatus for inspecting defects of a plurality of patterns formed on a substrate so as to have naturally the same shape, comprising:

table means on which the substrate is placed, and which can be moved in an X-Y plane;

image pick-up means for picking up the patterns of the substrate placed on the table means to produce images of the patterns;

proposed-defects extracting means for processing the images of the patterns when the substrate placed on the table means is continuously moved after at least one of the images of the patterns has been subjected to local gradation conversion and the images of the patterns have been aligned with an accuracy of one pixel unit, thereby extracting proposed defects of the patterns;

defect detection means for detecting true defects from the proposed defects of the patterns that have been extracted by the proposed-defects extraction means; and

output means for producing information of the true defects detected by the defect detection means.

23. (Amended) An apparatus according to claim 22, wherein the proposed-defects extraction means further estimates

certainty information of the extracted proposed defects based on at least one of a brightness, a local contrast, and a local average of the images of the patterns.

24. (Amended) An apparatus according to claim 22, further comprising:

storage means for storing the images of the patterns produced by the image pick-up means;

alignment means for aligning the images of the patterns stored in the storage means and the images of the patterns produced by the image pick-up means with an accuracy of one pixel unit; and

local gradation correction means for correcting a brightness of at least one of the images aligned by the alignment means;

wherein the proposed-defects extraction means extracts the proposed defects of the patterns from the aligned images, at least one of which has a brightness which has been corrected by the local gradation conversion means, and estimates certainty information of the extracted proposed defects.

25. (Amended) An apparatus according to claim 24, wherein the alignment means aligns the images of the patterns stored in the storage means and the images of the patterns produced by the image pick-up means with an accuracy of one pixel unit

within each of a plurality of small divisions of the images of the patterns.

26. (Amended) An apparatus according to claim 24, wherein the local gradation conversion means corrects a brightness of the at least one of the images aligned by the alignment means within each of a plurality of local areas of the at least one of the images aligned by the alignment means.

27. (Amended) An apparatus for inspecting defects of patterns, comprising:

image pick-up means for picking up a first pattern formed on a substrate and a second pattern that is formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a first image of the first pattern and a second image of the second pattern;

storage means for storing the first image;

defect detection means for correcting at least one of the stored first image and the second image by at least performing local gradation conversion of at least one of the stored first image and the second image and aligning the stored first image and the second image with an accuracy of one pixel unit, comparing the first image and the second image to detect defects after the at least one of the stored first image and the second image has been corrected, and then estimating information of the detected defects; and

display means for displaying on a screen the defects detected by the defect detection means, and the information of the detected defects.

28. (Amended) An apparatus according to claim 27, wherein said defect detection means includes:

alignment means for aligning the stored first image and the second image with an accuracy of one pixel; and

local gradation conversion means for performing local gradation conversion to correct a brightness of at least one of the stored first image and the second image;

wherein the defect detection means compares the aligned first and second images, at least one of which has a brightness which has been corrected by the local gradation conversion means, thereby detecting the defects.

29. (Amended) An apparatus according to claim 27, wherein the image pick-up means optically picks up the first and second patterns.

30. (Amended) An apparatus according to claim 27, wherein the image pick-up means picks up the first and second patterns by use of an electron beam.--

Add new claims 31-36 as follows:

--31. (New) A method according to claim 1, wherein the local gradation conversion minimizes a sum of squares of differences between the brightness of the first image and the brightness of the second image within each of a plurality of local areas of the first image and the second image.

32. (New) A method according to claim 7, wherein the local gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.

33. (New) A method according to claim 8, wherein the local gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.

34. (New) An apparatus according to claim 15, wherein the local gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.

35. (New) An apparatus according to claim 22, wherein the local gradation conversion minimizes a sum of squares of differences between a brightness of one of the images of the

patterns stored in the storage means and a brightness of one of the images of the patterns produced by the image pick-up means within each of a plurality of local areas of the one of the images of the patterns stored in the storage means and the one of the images of the patterns produced by the image pick-up means.

36. (New) An apparatus according to claim 27, wherein the local gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.--